



EINLADUNG

zum

VERA-SEMINAR

von

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## **Graphene - Two-dimensional carbon at atomic resolution**

Graphene is a crystalline single layer of carbon atoms that can be described as an individual atomic plane extracted from graphite. It is an outstanding new material that promises a wide range of new applications and scientific insights. Freely suspended mono-layer graphene is the thinnest possible membrane that is conceivable with currently known materials. Yet, it is remarkably stable under high-energy electron irradiation, and thus opens unprecedented opportunities also for electron microscopic studies. The graphene membrane structure and its defects are of outstanding interest for science and applications of this promising new material. Static deformations, topological defects, various vacancy configurations or the two-dimensional equivalent of dislocations were studied by transmission electron microscopy (TEM). The formation and evolution of defects under electron irradiation is observed in real time with atomic resolution. High-energy electron irradiation provides a continuous "randomization" of some atoms, which then allows new insights into the complicated bonding behaviour in carbon materials. Further, graphene membranes can serve as a perfect sample support for transmission electron microscopy. Its contribution to the TEM image signal can be filtered out completely and adsorbed atoms and molecules on the graphene sheet can be imaged as if they were suspended in free space. The synthesis, applications and numerous examples of conventional and aberration-corrected electron microscopic results are presented.

**Donnerstag, 28. Oktober 2010, 16:30 Uhr**

**1090 Wien, Währinger Str. 17, "Kavalierstrakt",  
1. Stock, Victor-Franz-Hess Hörsaal**